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Brief
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant : Kanji MINATO, et al.
Serial No. : 09/885,829
Filed : June 20, 2001
For : METHOD OF CONTROLLING SEED DISEASE
Group Art Unit : 3643
Examiner : Andrea M. Valenti

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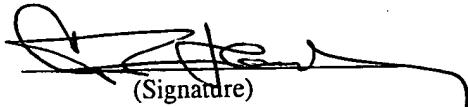
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APPEAL BRIEF

Sir:

This is an appeal from the final rejection on the merits of claims 1-14 in the
Office Action of September 23, 2002. A Notice of Appeal was received in the
Patent Office on February 26, 2003. This Brief is being submitted in triplicate.

REAL PARTY IN INTEREST

Rights in this application are assigned to Takii & Company, Limited, 180, Minami-Ebisucho, Inokuma Higashi-Iru, Umekoji-Dori, Shimogyo-ku, Kyoto, Japan which is the sole real party in interest.

RELATED APPEALS AND INTERFERENCES.

There are no appeals or interferences known to the appellant or appellant's legal representative which will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal in the present application.

STATUS OF CLAIMS IN THE APPLICATION

Claims 1-14 are in this application, and are being appealed. No claim has been canceled or allowed.

STATUS OF AMENDMENTS AFTER FINAL ACTION

An Amendment After Final Rejection was filed on December 17, 2002, but was not entered as indicated in the Advisory Action of February 6, 2003.

SUMMARY OF THE INVENTION

As recited in claim 1, the invention in its broadest aspects resides in a method of controlling a seed disease, i.e., in seeds which have been infected with the disease (page 1, lines 3-5) comprising the steps of:

sterilizing seeds by at least one of a physical technique and a chemical technique (page 8, lines 5-9, 14 and 15, Fig. 1);

treating the thus sterilized seeds by an effective microorganism which is antagonistic against a pathogen of a seed borne disease (page 8, lines 9, 10 and 15-17, Fig. 1).

The effective microorganism is preferably a plurality of microorganisms (page 10, lines 10-16, Fig. 1, claim 2). Some effective microorganisms are bacteria in the genus *Pantoea* and the genus *Leclercia*, which are antagonistic against a pathogenic bacterium of the genus *Xanthomonas* (Examples 1-4 on pages 20-34 and generally at page 20, lines 12-17; and claims 3 and 4).

Preferably an effective microorganism utilized in the method of the invention is one which has been separated from seeds which have been obtained by seed production (page 13, line 21 to page 14, line 15; generally at page 14, lines 21-23, claim 5). The seeds to be treated may be those which have been contaminated with the pathogen of the seed borne disease (page 13, line 24 to page 14, line 15; generally at page 13, line 24 to page 14, line 1, claim 6).

Examples of seeds which may be treated by the method of this invention are those belonging to a family selected from the group consisting of the family Brassicaceae, the family Umbelliferae, the family Solanaceae, the family Cucurbitaceae, the family Compositae, the family Liliaceae, the family Chenopodiaceae and the family Leguminosae (page 18, line 13 to page 19, line 8, claim 7).

In carrying out the method of this invention, a physical technique of sterilization which may be used is a dry heating or warm water treatment (page 11, lines 18 and 19, claim 8); a suitable chemical technique of sterilization is a soaking treatment, a powder-coating treatment, or a coating treatment, and wherein each treatment is performed using a synthetic agrochemical (page 11, lines 19-22, claim 9); and a treatment by the effective microorganism may be performed, for example, such that (1) the seeds are soaked in an aqueous dispersion of such effective microorganism (page 14, lines 18-20, claim 10); (2) the seeds are pelleted by a coating material containing the effective microorganism (page 14, lines 20-22, claim 11); (3) the seeds are film coated by a coating solution containing the effective microorganism (page 14, lines 22 and 23, claim 12); or (4) the seeds are treated to absorb water by contacting them with a carrier impregnated with an aqueous dispersion of the effective microorganism (page 14, line 24 to page 15, line 1, claim 13).

Finally, the invention covers seeds, a disease of which has been controlled by treating the seeds with the method of the invention, as recited in claim 14. The novelty and advantages of these seeds in terms of resistance to the disease and germination rates which are not adversely affected by the treatment, are shown in Examples 1-4 and Tables 2-5 on pages 23-34 of the disclosure.

ISSUES

The issues presented for review are as follows:

- (1) Whether claims 1, 2, 5-9 and 14 are anticipated under 35 U.S.C. 102(a) by Control of Phytopathogenic Prokaryotes By Cultural Management and Chemicals ("Cultural Management").
- (2) Whether claims 1, 2, 5-7 and 9-14 are anticipated under 35 U.S.C. 102(b) by U.S. Patent No. 4,828,999 to Jackson ("Jackson").
- (3) Whether claims 3 and 4 are unpatentable under 35 U.S.C. 103(a) over Jackson.
- (4) Whether claims 3 and 4 are unpatentable under 35 U.S.C. 103(a) over Cultural Management.
- (5) Whether claims 10-13 are unpatentable under 35 U.S.C. 103(a) over Cultural Management in view of U.S. Patent No. 5,783,411 to Schisler et al. ("Schisler").

GROUPING OF CLAIMS

For each ground of rejection which the appellant contests herein which applies to more than one claim, such additional claims, to the extent separately identified and argued below, do not stand or fall together.

ARGUMENT**Issue No. 1**

Whether claims 1, 2, 5-9 and 14 are anticipated under 35 U.S.C. 102(a) by Control of Phytopathogenic Prokaryotes By Cultural Management and Chemicals ("Cultural Management").

Cultural Management teaches methods of preventing seed disease by the utilization of methods, including physical methods such as application of hot air and water and heat caused by microwave irradiation (page 1, Section C, Table 2) and chemical methods such as application of various biocides (page 9, Section C) and application of antibiotics (page 12), which the final Office Action on the merits, mailed September 23, 2002 characterizes as an "effective microorganism" (page 2, seventh line from the bottom). In setting out this rejection, the Action on page 2, eighth line from the bottom, states that the "thus sterilized seeds", that is, seeds previously sterilized by a physical or chemical technique, are treated by an

"effective microorganism", a term applied by the Office Action to the antibiotics such as streptomycin disclosed by Cultural Management.

It should be noted first that the strategy and methods disclosed by Cultural Management are intended for the prevention of plant disease rather than the treatment of an already present active infection, as in applicants' method. Thus, Cultural Management states at Section IB on page 1 as follows: "Prophylactic management is best. Using this strategy, integrated systems of management are used to control disease before epiphytotics [i.e., active irritations of disease] occur."

Moreover, contrary to the assumption made in the rejection, antibiotics are not "effective microorganisms" as the term is used in claim 1 to define this invention, although such antibiotics may be produced by microorganisms. In this connection, note that 1) antibiotics are not equivalent to such microorganisms since they are used up in application and do not have the advantage possessed by microorganisms of being able to "proliferate on their own so that they hold a lasting controlling effect", as pointed out on page 4, lines 18 and 19 of the specification; and 2) there is nothing in the disclosure of Cultural Management to support the position that an antibiotic or anything that can be accurately described as an "effective microorganism" should be applied to seeds which have already been sterilized by a physical or chemical technique, as in independent claim 1 from

which all the other claims depend. Rather, all the techniques disclosed by Cultural Management may be used alternatively to achieve a specific advantage.

The rejection of Issue No. (1) was originally made in the Office Action of April 16, 2002 previous to the final Office Action on the merits, and the foregoing arguments against the rejection were originally made in applicants' amendment of July 16, 2002. However, in a "Response to Arguments" on page 6 of the final Office Action on the merits, reasons are given for deciding that the previously presented arguments against the rejections are not persuasive. It is submitted in this regard that these reasons are not convincing particularly with respect to the rejection of claims 1, 2, 5-9 and 14 which are solely based on anticipation by the prior art under 35 U.S.C. 102(a) or (b), since in this type of rejection and in contrast to rejections under 35 U.S.C. 103 based on obviousness, all of the limitations of each claim must be disclosed in a single reference; see MPEP (8th Ed.) 2131 and cases cited.

In the second paragraph of the "Response to Arguments" on page 6, the final Office Action on the merits states as follows:

Examiner maintains that applicant's broad claim language does not distinguish over the teachings of the prior art. Applicant does not claim the order in which the treatment is conducted. Instead, Applicant

merely claims that both sterilizing and microorganism are used as part of the method.

This statement appears to be in error since claim 1 recites that the seeds are sterilized by at least one of a physical and a chemical technique, and then recites that the thus sterilized seeds are treated by an effective microorganism. This clearly indicates that the seeds are first sterilized by a physical and/or chemical technique, and only then are treated with an effective microorganism. Furthermore, this is not merely arbitrary since it is apparent from the disclosure on pages 3 to 7 of the specification that the sequence of treatments is designed to improve the action of a physical or chemical treatment, e.g. the use of agrochemicals, in suppressing the harmful effects of any pathogenic microorganisms surviving the treatment, which while scarce in number, are still capable of initiating future infection. This would not be the result if the order of the treatments were reversed or the treatments were simultaneous since in that case, both the effective microorganisms as well as most of the pathogenic microorganisms are likely to be destroyed by the physical or chemical treatment and the seeds would not be as well protected from future attack by a possibly increased number of pathogenic microorganisms forming from those surviving the physical or chemical treatment.

The following is stated in the third paragraph of the "Response to Arguments" on page 6 of the final Office Action on the merits with regard to this rejection.

Examiner maintains that the antibiotics taught by Cultural Management teach that the antibiotic microbes are antagonists for other microbes and therefore are in fact effective microorganism.

There does not appear to be any accepted authority or basis for this statement. Rather the reference to antibiotics as "antibiotic microbes" indicates that there may be a misunderstanding in the Office Action of the meaning of the term "antibiotics". Thus, the universally accepted definition of "antibiotic" is as it appears in a standard U.S. dictionary, the Merriam Webster Collegiate Dictionary, 10th Edition, namely, "A substance produced by or a semisynthetic substance derived from a microorganism and able in dilute solution to inhibit or kill another microorganism". This clearly excludes from the definition the microorganism or microbe itself. Furthermore, there is a functionally significant difference between an antibiotic and a microorganism since unlike antibiotics, which can be used as agrochemicals and are consumed in use, effective microorganisms proliferate on

their own and exert a lasting controlling effect, as pointed out on page 4, lines 16-19 of the specification.

Regarding claims 6 to 9, the final Office Action on the merits points out various teachings of Cultural Management which are stated to disclose the specific features recited in these claims. The arguments stated previously against the rejection of claim 1 apply equally to claims 6 to 9, each of which is dependent from claim 1, regardless the features of dependent claims 6 to 9 allegedly taught by Cultural Management.

Aside from the questions of whether the treatment is prophylactic or designed to treat an active infection, the effect of order of treatments, and whether an antibiotic could be reasonably described as an "effective microorganism", as discussed previously, claims 2 and 5 recite features which are clearly absent from the disclosure of Cultural Management, and therefore further exempt these claims from a rejection based on anticipation by this reference. These features are the plurality of types of microorganism as the effective microorganism recited in claim 2, and the effective microorganism separated from seeds which have been obtained by seed production recited in claim 5.

It is also submitted that the rejection of claim 14 as anticipated by Cultural Management is not well taken since it has not been shown that diseased seeds treated by the method of this invention have the same properties as those treated by

the methods of the reference which is necessary to sustain an anticipation rejection. Rather, applicants have shown that diseased seeds treated by the method of the invention have properties different from those which are untreated or treated by prior art methods. Thus, the data shown in Examples 1-4 and Tables 2-5 on pages 23-34 of the disclosure indicate that seeds treated by the method of the invention generally have lower degrees of contamination by the disease causing pathogen and higher germination rates than untreated infected seeds or infected seeds treated by prior art methods.

Finally, it is believed that the different issues of interpretation of the reference and consideration of the relevant facts with regard to the rejection of claims 1, 2, 5-9 and 14 as anticipated by Cultural Management, as brought out or implied by the previous discussion of this rejection, supports the position that these claims should not stand or fall together, and that the rejection of each of these claims should be considered separately.

Issue No. 2

Whether claims 1, 2, 5-7 and 9-14 are anticipated under 35 U.S.C. 102(b) by U.S. Patent No. 4,828,999 to Jackson ("Jackson").

Jackson discloses a method of preventing or controlling bacterial harm to plants by applying to the plant a bacteriophage (virus) containing one or more viral

h mutants specific to at least one phage resistant mutant of the species of harmful bacterium. Also disclosed by Jackson in col. 6 is the development of a method of determining the number of bacteria on the surfaces and inside seeds by rinsing bean culls with distilled water (dw) and Clorox (NaOCl) solutions, inoculating aliquots from the rinses in a complex broth, and determining bacteria counts by plate count using complex agar media. As stated on the lower half of page 3 of the final Office Action on the merits, this rejection, particularly of claims 1 and 14, is based on an interpretation of the disclosure of Jackson, as previously described, which concludes that this reference teaches a method of controlling a seed disease by sterilizing the seeds with Clorox solution (a chemical technique) based on the disclosure starting at col. 6, line 45, and treating the thus sterilized seeds with an effective microorganism, i.e., a bacteriophage or virus, which is antagonistic against a pathogen of a seed borne disease. However, the foregoing interpretation of the Jackson disclosure, leading to the conclusion that it anticipates the aforementioned claims, is entirely unsupported by such disclosure, since the teaching of a Clorox treatment at the bottom of col. 6 of Jackson is solely as part of a procedure for determining the count of bacteria on the surfaces and inside of seeds, substituted in the described procedure by bean culls. There is no indication that a Clorox sterilizing treatment of bean culls or seeds is intended to be followed by a treatment with a bacteriophage as an effective microorganism. This is obvious

from a reading of the entire disclosure of Jackson from col. 6, line 19 to the end of Table II in col. 7, wherein no mention is made of any treatment with a bacteriophage.

Regarding claims 2, 5, 6, 7 and 9-13, the final Office Action on the merits identifies on pages 3 and 4 various portions of the Jackson disclosure which are stated to show the specific features recited in these claims. However, such claims are all dependent from claim 1, and it has been pointed out hereinbefore why claim 1 is not anticipated by Jackson. Moreover, with regard to the specific features recited in these claims, it should be noted that 1) the pathogenic bacteria mentioned in col. 3, lines 7-15 of Jackson pointed out in the Office Action, are not the same as the "effective microorganism" recited in Claim 5; 2) the pathogen disclosed at col. 3, line 28 of Jackson is not necessarily a pathogen of a seed borne disease as recited in claim 6 since there is no indication that the source of the pathogen is the mother plant; 3) the disclosure at col. 4, line 26 of Jackson of the use of 5% chloroform as part of a procedure to determine the bacteriophage mutants specific to a pathogenic bacterial host, is not the same as or equivalent to a chemical technique for sterilizing seeds prior to the treatment of such seeds with an effective microorganism, as recited in claim 9; and 4) the disclosure of Jackson at col. 4, line 26 does not teach the pelleting of seeds by a coating material containing the effective microorganism, as recited in claim 11.

Regarding claim 14, it is submitted that this claim is not anticipated by Jackson for the same reasons as those brought out previously in the discussion of the rejection as anticipated by Cultural Management in the Argument on Issue No. 1.

In view of the varying elements of fact and interpretation involved in the rejection of claims 1, 2, 5-7 and 9-14, as brought out in the foregoing discussion, it is submitted that these claims should not stand or fall together, but that the rejection of each claim should be considered separately.

Issue No. 3

Whether claims 3 and 4 are unpatentable under 35 U.S.C. 103(a) over Jackson.

As pointed out previously in the discussion of the rejection of claim 1 and other claims as being anticipated by Jackson in the argument for Issue No. 2, the disclosure of Jackson does not include the initial sterilization of seeds by a physical or chemical technique, followed by treatment with an effective microorganism, which is required by the rejected claims. Furthermore, there is nothing in such disclosure which would lead a person having ordinary skill in the art to adopt such a procedure. In addition, the Jackson disclosure is limited to the use of a bacteriophage, which is a virus, as an effective microorganism, whereas claims 3

and 4 each recites the use of a bacterium, which is entirely different from the bacteriophages (viruses) of Jackson, as the effective microorganism. Such differences between bacteria and viruses as microorganisms make it extremely unlikely that a person skilled in the art would ever substitute one for the other.

With regard to this rejection it should be noted also that claims 3 and 4 recite different effective microorganisms, claim 3 reciting the genus *Pantsea*, and claim 4 the genus *Laclercia*. Therefore, these claims should not stand or fall together but rather, their rejections should be considered separately.

Issue No. 4

Whether claims 3 and 4 are unpatentable under 35 U.S.C. 103(a) over Cultural Management.

This rejection is traversed on two grounds: 1) as discussed previously in connection with the rejection of claim 1 and other claims in the argument for Issue No. 1, as being anticipated by Cultural Management, the latter reference does not in fact disclose the initial sterilization of seeds followed by the application of an effective microorganism, as required by the methods of claims 3 and 4. Furthermore, there is nothing in the teaching of this reference to cause the skilled person to follow such procedure; and 2) as also brought out in the previous discussion of the rejection of claims as anticipated by Cultural Management,

antibiotics such as streptomycin, disclosed in this reference as pathogen antagonists and interpreted in the Office Action as the same as the effective microorganism of the present claims, are not in fact microorganisms at all but rather are compounds which may be synthesized by microorganisms. Again, there is nothing in the disclosure of Cultural Management which would lead a person having ordinary skill in the art to substitute a microorganism for the disclosed antibiotics.

The foregoing argument against this rejection was first made in the amendment of July 16, 2002 and was discussed as follows in the fourth paragraph of the "Response at Arguments" on page 6 of the final Office Action on the merits:

Examiner maintains that Cultural Management teaches all the treatments claimed by applicant and the advantages of these treatments on plant development. It would have been obvious to one of ordinary skill in the art to apply all or one of the treatments taught by Cultural Management for the enhanced treatment and increased survival rate/production. Using one or more of the treatments simultaneously is merely a design choice based on economic and time parameters, seed specific, and the location/weather conditions where

the seed will be planted. Prophylactic treatment is an integrated system of management to control disease and therefore commonly involves multiple treatment steps of varying techniques of treatment.

This statement apparently dismisses the detailed arguments presented by applicants against the effectiveness of Cultural Management as a prior art reference by taking the position that there is no invention in practicing any combination of the procedures disclosed regardless of any differences in the details of the overall process or unobvious results obtained. It is submitted that this is not adequate to sustain the soundness of the rejection in view of applicants' arguments,

Issue No. 5

Whether claims 10-13 are unpatentable under 35 U.S.C. 103(a) over Cultural Management in view of U.S. Patent No. 5,783,411 to Schisler et al. ("Schisler").

As stated previously, the primary reference, Cultural Management does not disclose or render obvious a method including the required initial sterilization by a physical or chemical technique followed by a treatment of the seeds with an effective microorganism, or the use of any effective microorganism at all since the antibiotics such as a streptomycin mentioned in the Office Action as fulfilling this

requirement are broad spectrum biocides rather than an effective microorganism; note the listing of antibiotics in Cultural Management under the heading "Directed Chemical Control" starting on page 9 of the reference. These shortcomings of the primary reference, Cultural Management, are not overcome, as suggested in the final Office Action on the merits, by the disclosure in Schisler at col. 7, lines 60-62 of administering techniques for treatment by an effective microorganism, including application as an aqueous spray or dip, as a wettable powder or as a dust, since there is no appreciation in the disclosure of either reference of the significance of the order of the treatments as stated previously. Moreover, Schisler et al. does not disclose as an administering technique, the pelleting of the seeds with a coating material containing the effective microorganism, as recited in claim 11. On this point, the last paragraph of the Response to Arguments on page 6 of the final Office Action on the merits states the following with regard to this issue involving the rejection of claims 10-13 under 35 U.S.C. 103(a) as unpatentable over Cultural Management in view of Schisler.

Furthermore, Examiner maintains that Schisler inherently teaches pelleting since the seed is a pellet and Schisler teaches the application of a dust or powder to the seed.

Applicants disagree with this interpretation of the term "pelleted" in claim 11. Thus, the Merriam Webster Collegiate Dictionary, 10th Edition, defines "pellet" used as a verb as the same as "pelletize" which in turn is defined as "to form or compact into pellets". Therefore, as used in claim 11, the term "pelleted" means compacting smaller particles into larger ones and excludes the mere application of a dust or powder to the seed, as suggested in the Office Action.

REFERENCES CITED BUT NOT ACTED ON

In the Advisory Action of February 6, 2003, applicants' attention was drawn to two newly cited references - U.S. patent No. 5,628,144 to Eastin ("Eastin") and U.S. patent No. 4,367,609 to Lloyd ("Lloyd"). Applicants wish to comment briefly on the disclosures of these references for the purpose of possibly simplifying future issues in the prosecution of this or successor applications.

It is noted that neither Eastin nor Lloyd discloses or suggests applicants' basic inventive concept, namely, the control of a seed borne disease by using a physical or chemical technique to sterilize the seeds against the pathogenic microorganism causing the disease and then treating the thus sterilized seeds with an effective microorganism which is antagonistic against such pathogenic microorganism. More specifically, Eastin discloses a method of priming seeds by treating them with a solid matrix material and a controlled amount of water to

enhance resultant plant vigor without causing the seeds to sprout. Chemical treatment, e.g. with pesticides and growth regulators, and inoculation with beneficial microorganisms useful in crop protection, stimulation or establishment, may be combined with the priming treatment. However, there is no suggestion in this patent of the control in seeds of a single seed borne disease, a physical or chemical sterilization treatment to remove all or most microorganisms, and the subsequent treatment of the seeds with an effective microorganism known to be antagonistic against a pathogen of the seed borne disease.

Lloyd discloses a method for improving the survival of a beneficial microorganism used with seeds, e.g. rhizobia bacteria which aid in nitrogen fixation, by using a water soluble polyvinylpyrrolidone in conjunction with the microorganism. Again, there is no suggestion in this patent of any of the main elements of applicant's inventive concept as described previously in the discussion of Eastin.

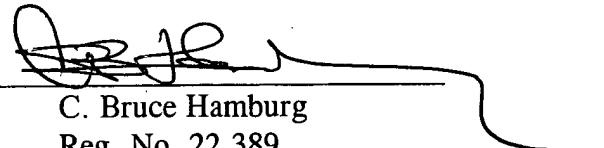
In view of the foregoing arguments, reversal of the final rejection and allowance of all the claims on appeal are earnestly solicited.

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Respectfully submitted,

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APPENDIX**LISTING OF APPEALED CLAIMS**

1. A method of controlling a seed-disease comprising the steps of:

sterilizing seeds by at least one of a physical technique and a chemical technique; and

treating the thus sterilized seeds by an effective microorganism which is antagonistic against a pathogen of a seed borne disease.

2. The method of controlling the seed disease according to claim 1, wherein

said effective microorganism is a plurality of types of microorganisms.

3. The method of controlling the seed disease according to claim 2, wherein

at least one type of said effective microorganisms is a bacterium belonging to the genus *Pantoea* which is antagonistic against a pathogenic bacterium belonging to the genus *Xanthomonas*.

4. The method of controlling the seed disease according to claim 2, wherein

at least one type of said effective microorganisms is a bacterium belonging to the

genus *Leclercia* which is antagonistic against a pathogenic bacterium belonging to the genus *Xanthomonas*.

5. The method of controlling the seed disease according to claim 1, wherein at least one type of said effective microorganisms is a microorganism separated from seeds which have been obtained by seed production.

6. The method of controlling the seed disease, according to claim 1, wherein the seeds to be treated are those which have been contaminated with the pathogen of the seed borne disease.

7. The method of controlling the seed disease according to claim 1, wherein the thus treated seeds are those belonging to a family selected from the group consisting of the family *Brassicaceae*, the family *Umbelliferae*, the family *Solanaceae*, the family *Cucurbitaceae*, the family *Compositae*, the family *Liliaceae*, the family *Chenopodiaceae* and the family *Leguminosae*.

8. The method of controlling the seed disease according to claim 1, wherein said physical technique is a dry-heating treatment or a warm-water treatment.

9. The method of controlling the seed disease according to claim 1, wherein said chemical technique is a treatment selected from the group consisting of a soaking treatment, a powder-coating treatment, and a coating-treatment, and wherein all three treatments are performed using a synthetic agrochemical.

10. The method of controlling the seed disease according to claim 1, wherein a treatment by said effective microorganism is performed such that the seeds are soaked in an aqueous dispersion of the effective microorganism.

11. The method of controlling the seed disease according to claim 1, wherein a treatment by said effective microorganism is performed such that the seeds are pelleted by a coating material containing the effective microorganism.

12. The method of controlling the seed disease according to claim 1, wherein a treatment by said effective microorganism is performed such that the seeds are film-coated by a coating solution containing the effective microorganism.

13. The method of controlling the seed disease according to claim 1, wherein a treatment by said effective microorganism is performed such that the

seeds are allowed to absorb water by contacting a carrier impregnated with an aqueous dispersion of the effective microorganism.

14. (Amended) Seeds a disease of which has been controlled by treating the seeds by the method of claim 1.